

**WEST**

Generate Collection

L1: Entry 5 of 10

File: EPAB

Aug 27, 1992

PUB-NO: DE004105742A1

DOCUMENT-IDENTIFIER: DE 4105742 A1

TITLE: 2,6-Di:fluoro-tolan derivs. - useful as components of liq. crystal media for electro-optical displays

PUBN-DATE: August 27, 1992

## INVENTOR-INFORMATION:

NAME	COUNTRY
REIFFENRATH, VOLKER	DE
PLACH, HERBERT DR	DE

INT-CL (IPC): C07C 25/24; C07C 43/225; C07D 213/24; C07D 239/24; C07D 319/06; C09K 19/06; G02F 1/13; G09F 9/35

EUR-CL (EPC): C07C043/225; C09K019/18, C09K019/30 , C09K019/42 , C09K019/34 , C09K019/34 , C09K019/34

## ABSTRACT:

CHG DATE=19990617 STATUS=O>2,6-Difluorotolans of formula (I) are claimed. R1, R2= 1-18C alk(en)yl, opt. with 1 or 2 non-adjacent CH2 gps. replaced by O, S, COO or OCO; one of these gps. can also = F, Cl, CN, CF3, OCF3 or OCF2H; A1, A2= 1,4-cyclohexylene, 1,4-phenylene, 2- or 3-fluoro-1,4-phenylene, 2,3-difluoro-1,4-phenylene, 2,6- or 3,5-difluorophenylene, dioxan-2,5-diyl, pyridine-2,5-diyl or pyrimidine-2,5-diyl; Z1, Z2= -CH2CH2-, -(CH2)4-, -CH2O-, -OCH2-, -CC- or a single bond; m, p = 0, 1 or 2; o= 0, 1 or 2. USE/ADVANTAGE - (I) are useful as components of liq. crystal (LC) media for electro-optical displays. Also claimed are LC media with at least 2 components, at least one of which contains a 2,6-difluorotolan gp. as in (I), pref. a cpd. of formula (I), and electro-optical displays contg. such LC media. The incorporation of (I) gives stable LC media with relatively high optical anisotropy and pronounced positive dielectric anisotropy, useful esp. in TNC-based display elements; cpds. (I) have high chemical, thermal and light stability, and form LC mesophases in the relevant temp. range.

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L6: Entry 1 of 2

File: JPAB

Nov 2, 1993

PUB-NO: JP405286920A

DOCUMENT-IDENTIFIER: JP 05286920 A

TITLE: DIFLUOROCYANO COMPOUND, LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL ELECTRO-OPTIC DEVICE

PUBN-DATE: November 2, 1993

## INVENTOR-INFORMATION:

NAME

COUNTRY

TACHIBANA, TAMON

INOUE, KANJI

US-CL-CURRENT: 558/423

INT-CL (IPC): C07C 255/50; C07C 255/54; C07D 239/26; C09K 19/18; C09K 19/34

## ABSTRACT:

PURPOSE: To provide the subject new difluorocyano compound capable of providing a chemically stable liquid crystal composition exhibiting a lowered threshold voltage and capable of lowvoltage drive.

CONSTITUTION: A compound of formula I [A is a 1,4-disubstituted phenylene (One or two or more CH may be substituted with N) which may have one or two or more halogen or methyl as substituents; R is H or a 1 to 10C alkyl (One or two or more H may be substituted with F. O may be inserted into a C-C bond including one between the substituent group and the ring)], e.g. a compound of formula 13. The above-mentioned compound can be obtained from 3,5-difluorobenzoic acid of formula 2 as the starting material by a reaction according to the reaction formula.

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L7: Entry 1 of 6

File: JPAB

Jun 10, 1997

PUB-NO: JP409151373A

DOCUMENT-IDENTIFIER: JP 09151373 A

TITLE: NEMATIC LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY USING THE SAME

PUBN-DATE: June 10, 1997

## INVENTOR-INFORMATION:

NAME

COUNTRY

TAKEUCHI, KIYOBUMI

TAKATSU, HARUYOSHI

ISHIDA, TOKUE

INT-CL (IPC): C09 K 19/02; C09 K 19/34; C09 K 19/42; C09 K 19/44; C09 K 19/46; G02 F 1/13

## ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a nematic liquid crystal composition which comprises two liquid crystal components containing a plurality of compounds each having specific dielectric anisotropy respectively at a specific ratio, satisfies specific conditions, realizes the rapid response and is useful as an electrooptical display material.

SOLUTION: This liquid crystal composition comprises (A) 40-80wt.% a liquid crystal component containing at least  $\geq 5$  kinds of tolan compounds with a dielectric anisotropy of  $-2 \sim +2$  [preferably of formula I (R11 is a 2-5C straight chain alkyl; R14 is a 1-5C straight chain alkyl; Y11 is H, F, CH3)] and (B) 5-60wt.% of a liquid crystal component containing two or more compounds with a dielectric anisotropy of  $\geq +2$  [preferably a compound of formula II (R21 is a 2-7C straight chain alkyl; Z21 and Z22 are each a single bond; Y21 and Y22 are each H, F; (k) is 0, 1)], and shows the dielectric anisotropy of  $\geq 3$ , an optical birefringence of  $\geq 0.15$ , the phase transition point from the nematic phase to the isotropic phase at  $\geq 70^\circ\text{C}$ , while that from the crystal phase or the smectic phase to the nematic phase at  $\geq -10^\circ\text{C}$ .

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L7: Entry 2 of 6

File: JPAB

Mar 28, 1997

PUB-NO: JP409080396A

DOCUMENT-IDENTIFIER: JP 09080396 A

TITLE: PRODUCTION OF LIQUID CRYSTAL DEVICE

PUBN-DATE: March 28, 1997

## INVENTOR-INFORMATION:

NAME

COUNTRY

NAKADA, HIDETOSHI

TAKEUCHI, HISASHI

FUJISAWA, NOBURU

AIZAWA, MASAO

INT-CL (IPC): G02 F 1/1333; G02 F 1/13

## ABSTRACT:

PROBLEM TO BE SOLVED: To provide a liquid crystal device having a light-controlling layer comprising a liquid crystal and a polymer and to provide a liquid crystal device having good contrast, high voltage holding rate and excellent heat resistance.

SOLUTION: The liquid crystal device having a light-controlling layer containing a liquid crystal compsn. and a transparent polymer material held between two substrates is produced by the following method. A material for formation of a light-controlling layer containing a liquid crystal compsn. and a polymerizable component is held between two substrates having electrode layers at least one of which is transparent and the polymerizable compsn. is polymerized. (1) The liquid crystal compsn. has a specific resistance between  $1 \times 10^{13} \Omega \cdot \text{cm}$  and  $1 \times 10^{15} \Omega \cdot \text{cm}$  at 25°C. (2) The polymerizable compsn. has the specific resistance between  $1 \times 10^{13} \Omega \cdot \text{cm}$  and  $1 \times 10^{15} \Omega \cdot \text{cm}$  at 25°C.

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L7: Entry 3 of 6

File: JPAB

Feb 13, 1996

PUB-NO: JP408040945A

DOCUMENT-IDENTIFIER: JP 08040945 A

TITLE: 1-(4-CYCLOHEXYLPHENYL)-2-PHENYLETHANE DERIVATIVE

PUBN-DATE: February 13, 1996

## INVENTOR-INFORMATION:

NAME

COUNTRY

OSAWA, MASASHI

TAKEHARA, SADA0

TAKATSU, HARUYOSHI

INT-CL (IPC): C07 C 13/28; C07 C 22/08; C07 C 25/18; C07 C 43/215; C07 C 255/50; C09 K 19/30; C09 K 19/42; C09 K 19/46; G02 F 1/13

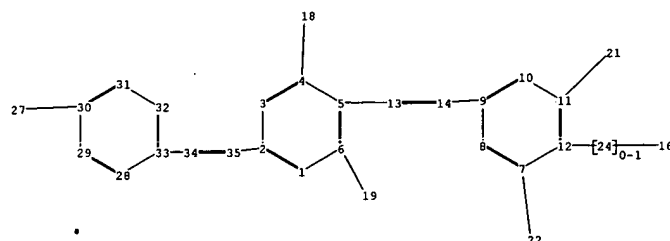
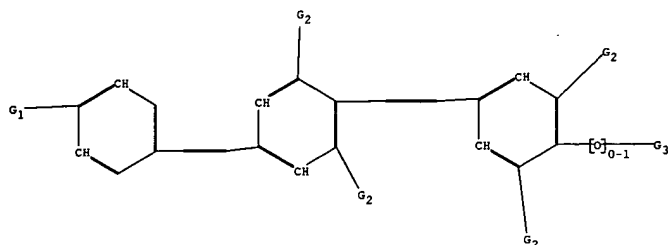
## ABSTRACT:

PURPOSE: To provide a liquid crystal mixture which comprises 2 or more of 1-(4-cyclohexylphenyl)-2-phenylethane derivatives with its melting point lowered without reduction in the upper-limit temperature of the nematic phase of this composition and precipitates no crystal even at a lowered temperature, thus is useful as a material for liquid crystal display elements.

CONSTITUTION: This mixture comprises 2 or more compounds of formula I [R1 is a 1-12C alkyl; n is 0, 1; X1-X3 are each H, deuterium (D) where at least one is D; Y1-Y5 are each H, F; Z is F, Cl; cyclohexan rings have the trans configuration], and they differ mutually in the number of D in X1-X3 and/or the substitution positions, while they are equal to each other in R1, n, Y1-Y5 and Z. One example of the compound of formula I is 1(3,4-difluorophenyl)ethyl-2,6-difluoro-4-(2,2,6-d3-trans-4-propylcyclohexyl)benzene. This compound is prepared, for example, by allowing a compound of formula II to react with deuterium and converting the resultant a mixture of formula III through a compound of formula IV to the target compound.

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9-18-02



chain nodes :

13 14 16 18 19 21 22 24 27 34 35

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 28 29 30 31 32 33

chain bonds :

2-35 4-18 5-13 6-19 7-22 9-14 11-21 12-24 13-14 16-24 27-30 33-34 34-35

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 28-29 28-33 29-30  
30-31 31-32 32-33

exact/norm bonds :

4-18 6-19 7-22 11-21 12-24 16-24 27-30

exact bonds :

2-35 5-13 9-14 13-14 33-34 34-35

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 28-29 28-33 29-30  
30-31 31-32 32-33

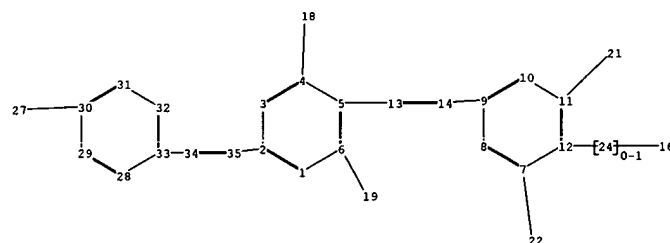
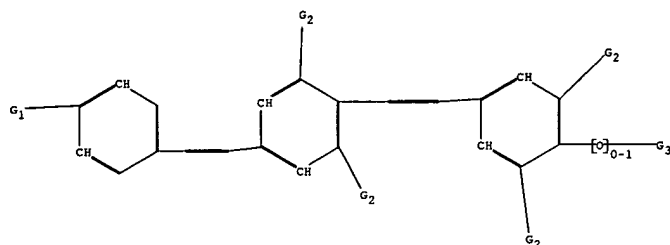
G1:C,O

G2:H,F

G3:CN,CF3,N,F

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom  
12:Atom 13:CLASS 14:CLASS 16:CLASS 18:CLASS 19:CLASS 21:CLASS 22:CLASS 24:CLASS  
27:CLASS 28:Atom 29:Atom 30:Atom 31:Atom 32:Atom 33:Atom 34:CLASS 35:CLASS



chain nodes :

13 14 16 18 19 21 22 24 27 34 35

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 28 29 30 31 32 33

chain bonds :

2-35 4-18 5-13 6-19 7-22 9-14 11-21 12-24 13-14 16-24 27-30 33-34 34-35

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 28-29 28-33 29-30  
30-31 31-32 32-33

exact/norm bonds :

4-18 6-19 7-22 11-21 12-24 16-24 27-30

exact bonds :

2-35 5-13 9-14 13-14 33-34 34-35

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 28-29 28-33 29-30  
30-31 31-32 32-33

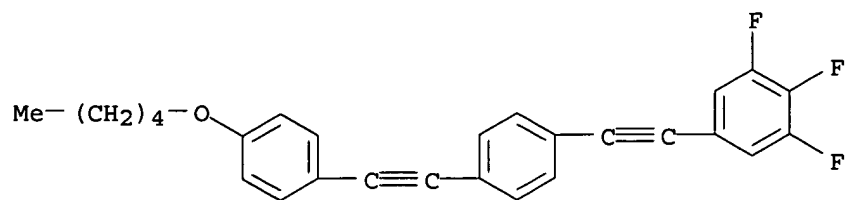
G1:C,O

G2:H,F

G3:CN,CF3,N,F

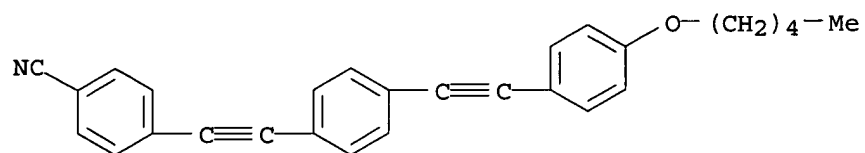
Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom  
12:Atom 13:CLASS 14:CLASS 16:CLASS 18:CLASS 19:CLASS 21:CLASS 22:CLASS 24:CLASS  
27:CLASS 28:Atom 29:Atom 30:Atom 31:Atom 32:Atom 33:Atom 34:CLASS 35:CLASS



RN 296255-72-6 CAPLUS

CN Benzonitrile, 4-[[4-[[4-(4-methoxyphenyl)ethynyl]phenyl]ethynyl]phenyl]ethynyl] - (9CI)  
(CA INDEX NAME)





- (16) Sekine, C; Mol Cryst liq Cryst in the press
- (17) Sekine, C; Proc IDW98 1998, P411 CAPLUS
- (18) Sekine, C; Proceedings of Liquid Crystal Conference of Japan 1998, V2B11
- (19) Sumitomo Chemical Co Ltd; JP 98-43289 1998
- (20) Sutherland, R; Chem Mater 1993, V5, P1533 CAPLUS
- (21) Takatsu, H; Mol Cryst liq Cryst 1986, V141, P279 CAPLUS
- (22) Tokumaru, T; Proceedings of the Anglo-Japanese Seminar on Liquid Crystals 1999, P72
- (23) Wu, S; Appl Phys Lett 1999, V74, P344 CAPLUS
- (24) Wu, S; J appl Phys 1989, V65, P4372 CAPLUS
- (25) Wu, S; Jpn J appl Phys 1999, V38, PL286 CAPLUS
- (26) Wu, S; Mol Cryst liq Cryst 1995, V261, P79 CAPLUS
- (27) Wu, S; SID tech Dig 1985, V16, P262

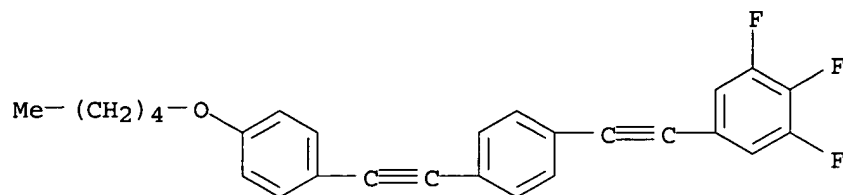
IT 239104-62-2P 296255-72-6P

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)

(prepn., liq. crystal properties, optical properties and viscosity of)

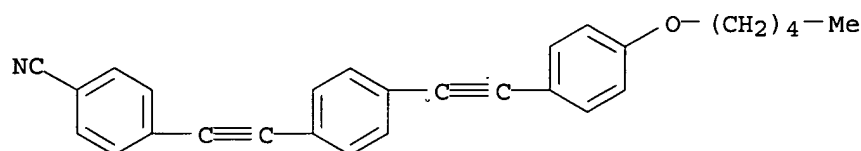
RN 239104-62-2 CAPLUS

CN Benzene, 1-[[4-(pentyloxy)phenyl]ethynyl]-4-[(3,4,5-trifluorophenyl)ethynyl]- (9CI) (CA INDEX NAME)



RN 296255-72-6 CAPLUS

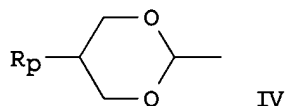
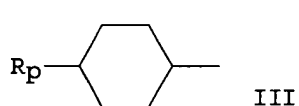
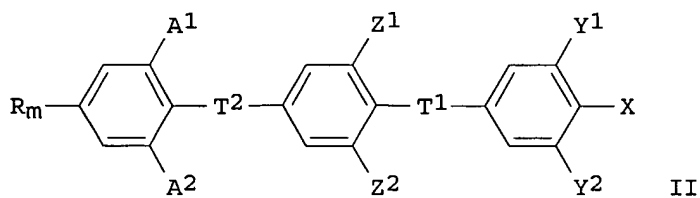
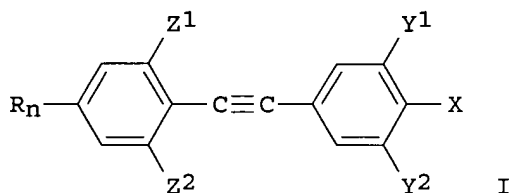
CN Benzonitrile, 4-[[4-[[4-(pentyloxy)phenyl]ethynyl]phenyl]ethynyl]- (9CI) (CA INDEX NAME)



AN 2002:185256 CAPLUS  
 DN 136:239416  
 TI Polar tolane liquid crystals  
 IN Wu, Shin-Tson; Chai, Zheng; Dalton, Larry R.  
 PA HRL Laboratories, LLC, USA  
 SO PCT Int. Appl., 30 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C09K019-00  
 CC 75-11 (Crystallography and Liquid Crystals)  
 Section cross-reference(s): 25

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002020697	A2	20020314	WO 2001-US27194	20010830
	WO 2002020697	A3	20020510		
	W: AE, AG, AL, AM, AT, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, CZ, DE, DE, DK, DM, DZ, EC, EE, EE, ES, FI, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2001085365	A5	20020322	AU 2001-85365	20010830
PRAI	US 2000-655466	A	20000905		
	WO 2001-US27194	W	20010830		
OS	MARPAT 136:239416				
GI					



AB A new class of liq. crystal compds. is based on tolane and bis-tolane structures: (I, II), in which X is a polar group such as F, CN, OCF3, or NCS at least one of the pairs of sites Y1 and Y2, Z1 and Z2, and A1 and A2 are F or H groups. T1 and T2 are either both triple bonds or one of the two groups is a double bond with and the other remains a triple bond. Rn

or Rm may be an alkyl group  $C_nH_{2n+1}$ , an alkenyl group  $C_nH_{2n-1}$ , an alkoxy group  $OC_nH_{2n+1}$ , or an alkenoxy group having the general formula  $-OC_nH_{2n-1}$ . Addnl. Rn may be a cyclohexyl substituent (III), or a dioxane substituent (IV), in which Rp is an alkyl group having the general formula general formula  $C_xH_{2x+1}$ , an alkenyl group  $C_xH_{2x-1}$ , an alkoxy group  $OC_xH_{2x+1}$ , or an alkenoxy group  $OC_xH_{2x-1}$ . These compds. exhibit useful nematic ranges and m.ps. For example, 1-(4-butylphenylethynyl)-4-(3,4,5-trifluorophenylethynyl)benzene can be prepd. having nematic range of 115-188.degree. and fusion enthalpy of 3.85 kcal/mol. Also disclosed are eutectic mixts. including these compds.

ST nematic liq crystal tolane prepn

IT Liquid crystals

(nematic; prepn. of polar asym. tolane and bis-tolane nematic liq. crystals and component of eutectic mixts.)

IT Fusion enthalpy

(of (butylphenylethynyl)(trifluorophenylethynyl)benzene nematic liq. crystal)

IT 7681-65-4, Cuprous iodide 116694-43-0, Dichloro(triphenylphosphine)palladium

RL: CAT (Catalyst use); USES (Uses)

(catalyst in prepn. of polar tolane liq. crystals)

IT 121-44-8, Triethylamine, uses 603-35-0, Triphenylphosphine, uses

RL: NUU (Other use, unclassified); USES (Uses)

(in prepn. of polar tolane liq. crystals)

IT 79887-09-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and bromination with bromiodobenzene in prepn. of polar tolane liq. crystals)

IT 501-65-5DP, Diphenylacetylene, derivs. 1849-27-0DP, 1,4-

Bis(phenylethynyl)benzene, derivs. 173035-17-1P 403500-34-5DP,

1-(Phenylethynyl)-4-(3,4,5-trifluorophenylethynyl)benzene, derivs.

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn. and nematic liq. crystal properties and component of eutectic mixts.)

IT 403500-33-4DP, Phenyl(3,4,5-trifluorophenyl)acetylene, derivs.

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. and nematic liq. crystal properties and component of eutectic mixts.)

IT **403500-30-1P**, 1-(4-Butylphenylethynyl)-4-(3,4,5-trifluorophenylethynyl)benzene

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn. and properties of nematic liq. crystal)

IT 62856-45-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and reaction with (trimethylsilyl)acetylene in prepn. of polar tolane liq. crystals)

IT 403500-31-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and reaction with base to remove trimethylsilane in prepn. of polar tolane liq. crystals)

IT 403500-32-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and reaction with bromotrifluorobenzene in prepn. of polar tolane liq. crystals)

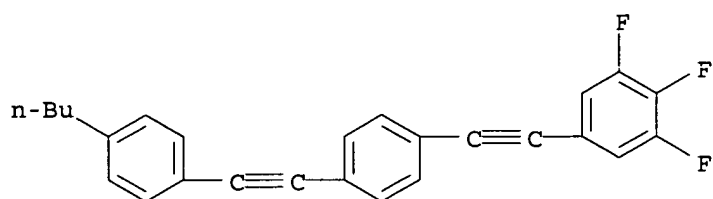
IT 202524-78-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and reaction with sodium hydroxide to remove trimethylsilane in prepn. of polar tolane liq. crystals)

IT 1310-73-2, Sodium hydroxide, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactant in prepn. of polar tolane liq. crystals)  
 IT 20651-67-6, 1-Butyl-4-iodobenzene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with (trimethylsilyl)acetylene in presence of Pd(PPh<sub>3</sub>)Cl<sub>2</sub>/CuI  
 catalyst and triethylamine in prepn. of polar tolane liq. crystals)  
 IT 1066-54-2, (Trimethylsilyl)acetylene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with butyliodobenzene in presence of Pd(PPh<sub>3</sub>)Cl<sub>2</sub>/CuI catalyst  
 and triethylamine in prepn. of polar tolane liq. crystals)  
 IT 403500-30-1P, 1-(4-Butylphenylethynyl)-4-(3,4,5-  
 trifluorophenylethynyl)benzene  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and properties of nematic liq. crystal)  
 RN 403500-30-1 CAPLUS  
 CN Benzene, 1-[(4-butylphenyl)ethynyl]-4-[(3,4,5-trifluorophenyl)ethynyl]-  
 (9CI) (CA INDEX NAME)



AN 2000:694362 CAPLUS  
 DN 133:259477  
 TI Optically anisotropic films and liquid crystal devices  
 IN Yamamoto, Kyoko; Kuwahara, Masato; Fujisawa, Koichi  
 PA Sumitomo Chemical Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C08J005-18  
 ICS G02B005-30; G02F001-1336  
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 73

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000273205	A2	20001003	JP 1999-82414	19990325
OS	MARPAT 133:259477				
AB	<p>The films contain .gtoreq.1 compd(s). having formula  <math>R1A1p(C.tplbond.C)mA2q(C.tplbond.C)nA3rR2</math> (<math>R1-2 = H, F, \text{trifluoromethyl, trifluoromethoxy, cyano, C1-12 alkyl, alkoxy, C2-12 alkenyl, alkynyl, alkoxyalkyl; A1, A3} = 1,4\text{-phenylene or } 1,4\text{-cyclohexylene with optional substitutions of their H atoms with C1-10 alkyl or F; A2} = 1,4\text{-phenylene with optional substitutions of their H atoms with C1-10 alkyl or F; p, r} = 0, 1; m, n = 0, 1, 2; q = 1, 2, 3; p = r \text{ .noteq. } 0 \text{ when } q = 1</math>). The films show retardation (at 550 nm) of 50-3000 nm and have .alpha. .gtoreq.1.07, where .alpha. = <math>RF/RD</math> [<math>RF = \text{retardation value at } 486 \text{ nm (H F line); RD} = \text{retardation value at } 589 \text{ nm (Na D line)}</math>]. Liq. crystal displays comprising of the films are also claimed. Black-and-white displays with wide view angles are obtained by combination with high-speed STN-type liq. crystal cells.</p>				
ST	biphenyl optical anisotropic film LCD; liq crystal display optical anisotropic film; arom acetylene optical anisotropic film; cyclohexylene optical anisotropic film LCD				
IT	Optical films (anisotropic; optically anisotropic films contg. polyphenylenes or arom. acetylenes for liq. crystal displays with wide view angle)				
IT	Optical anisotropy (films; optically anisotropic films contg. polyphenylenes or arom. acetylenes for liq. crystal displays with wide view angle)				
IT	Liquid crystal displays (optically anisotropic films contg. polyphenylenes or arom. acetylenes for liq. crystal displays with wide view angle)				
IT	<p>886-66-8, 1,4-Diphenylbutadiyne 40817-08-1, 4'-Pentyl-4-biphenylcarbonitrile 52364-71-3, 4'-Pentyloxy-4-biphenylcarbonitrile 54211-46-0, 5CT 167858-20-0 <b>239104-62-2 296255-72-6</b>        RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)        (optically anisotropic films contg. polyphenylenes or arom. acetylenes for liq. crystal displays with wide view angle)</p>				
IT	<p><b>239104-62-2 296255-72-6</b>        RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)        (optically anisotropic films contg. polyphenylenes or arom. acetylenes for liq. crystal displays with wide view angle)</p>				
RN	239104-62-2 CAPLUS				
CN	Benzene, 1-[[4-(pentyloxy)phenyl]ethynyl]-4-[(3,4,5-trifluorophenyl)ethynyl]- (9CI) (CA INDEX NAME)				

TABLE 19

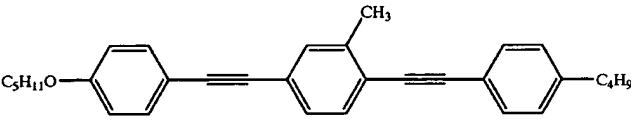
	wt %
	12.1
Composition D	87.9

TABLE 20

	$\Delta n$
Composition 9	0.32
Composition D	0.30

15

TABLE 23

	$\Delta n$
Composition 10	0.16
Composition E	0.12

20

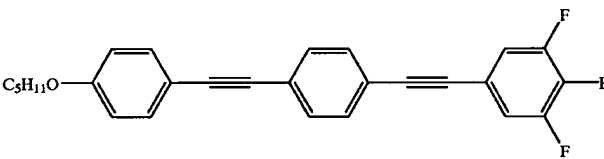
## EXAMPLE 15

The compound (2-6) corresponding to the formula (2) was mixed into the composition B prepared in example 7 in the ratios shown in Table 21, resulting in a composition E.

25

The phenylacetylene compound having an alkyl group in its skeleton, and the liquid crystal composition using the compound of the present invention each have large anisotropies of refractive index, are stable, tend to be mixed into other liquid crystals, and are especially useful as a material for constituting a liquid crystal element represented by, for

TABLE 21

	wt %
Composition B	90.1
	9.9

Then, into the composition E, was mixed the compound (1-2) corresponding to the formula (1) in the ratio shown in Table 22, resulting in a liquid crystal composition 10. Subsequently, the measurement of each  $\Delta n$  of the liquid crystal composition 10 and the composition E was carried out at 30° C. The results are shown in Table 23.

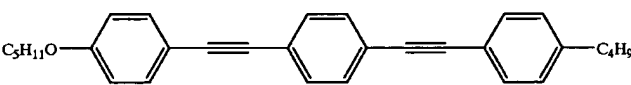
45

Table 23 reveals that the liquid crystal composition 10 of the present invention has the larger  $\Delta n$ , and is more excellent as compared with the composition E.

50

example, a STN (supertwisted nematic) liquid crystal element and a PDLC (polymer dispersed liquid crystal) type liquid crystal element. Further, the liquid crystal composition of the present invention includes the compound represented by the formula (2), and the compound represented by the formula (3) and/or the formula (4). Consequently, it has a large anisotropy of refractive index and is stable, and hence it is useful especially as a material for constituting a liquid crystal element represented by a STN (supertwisted nematic) liquid crystal element or a PDLC (polymer dispersed liquid crystal) type liquid crystal element.

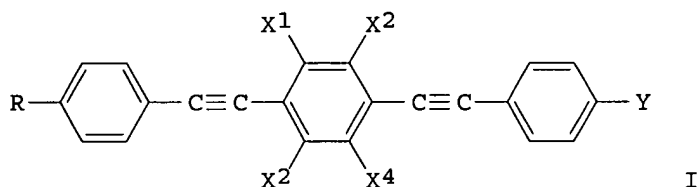
TABLE 22

	wt %
	11.4
Composition E	88.6

AN 1994:545561 CAPLUS  
 DN 121:145561  
 TI Tolan derivatives and liquid-crystal compositions and display devices using them  
 IN Yamada, Shuhei; Ikukawa, Shuji; Ito, Jun; Nakayama, Jitsuko  
 PA Seiko Epson Corp., Japan  
 SO Eur. Pat. Appl., 29 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM C07C025-24  
 ICS C09K019-18; C07C255-50  
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 581272	A1	19940202	EP 1993-112087	19930728
	EP 581272	B1	19960508		
	R: DE, FR, GB				
	JP 06316541	A2	19941115	JP 1993-121701	19930524
	US 5356558	A	19941018	US 1993-94353	19930721
PRAI	JP 1992-201333		19920728		
	JP 1992-250006		19920918		
	JP 1993-1933		19930108		
	JP 1993-49571		19930310		
	JP 1993-121701		19930524		
OS	MARPAT 121:145561				
GI					



AB Disclosed is a tolan deriv., a liq.-crystal compn. contg. the deriv., and a liq.-crystal display device using the compn., where the tolan deriv. has the general formula I, where R = C1-10 linear alkyl; X1,X2,X3,X4 = F or H and .gtoreq.1 of them is F; and Y = CN or C1-10 linear alkyl. By blending the above-described compd. with a general liq.-crystal compn., a compn. can be provided which exhibits a wide practical temp. range as well as a large anisotropy of the refractive index.

ST tolan deriv liq crystal compn display

IT Liquid crystals  
 (tolan derivs., compns. contg.)

IT Optical imaging devices  
 (electrooptical liq.-crystal, tolan derivs. for)

IT 155905-84-3  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (liq. crystal, for display devices)

IT 3032-92-6P, 4-Cyanophenylacetylene 62452-73-7P 79887-09-5P  
 79887-10-8P 80151-20-8P 126930-73-2P 136434-77-0P 141743-49-9P  
 145349-66-2P 149647-65-4P 155906-07-3P 155906-08-4P 155906-09-5P  
 155906-10-8P 155906-11-9P 155906-12-0P 155906-13-1P 155906-14-2P  
 155906-15-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and reaction of, in formation of tolan derivs. for liq.-crystal compns. and display devices)

IT 155905-83-2P 155905-85-4P 155905-86-5P 155905-87-6P 155905-88-7P  
 155905-89-8P 155905-90-1P 155905-91-2P 155905-92-3P 155905-93-4P  
 155905-94-5P **155905-95-6P** 155905-96-7P 155905-97-8P  
 155905-98-9P 155905-99-0P 155906-00-6P 155906-01-7P  
**155906-02-8P** 155906-03-9P 155906-04-0P 155906-05-1P  
 155906-06-2P

RL: TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(prepn. of, for liq.-crystal compns. and display devices)

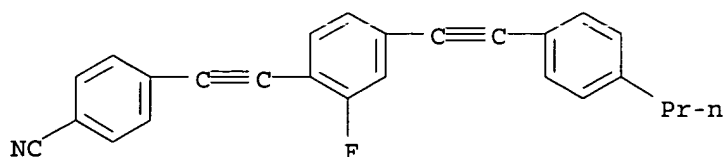
IT **155905-95-6P 155906-02-8P**

RL: TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(prepn. of, for liq.-crystal compns. and display devices)

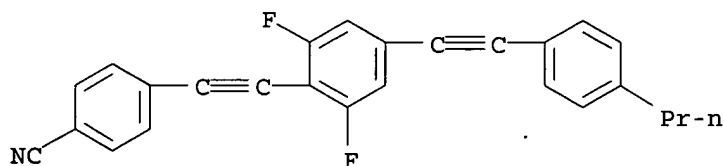
RN 155905-95-6 CAPLUS

CN Benzonitrile, 4-[[2-fluoro-4-[(4-propylphenyl)ethynyl]phenyl]ethynyl] - (9CI) (CA INDEX NAME)



RN 155906-02-8 CAPLUS

CN Benzonitrile, 4-[[2,6-difluoro-4-[(4-propylphenyl)ethynyl]phenyl]ethynyl] - (9CI) (CA INDEX NAME)





AN 2001:705633 CAPLUS  
 DN 136:13155  
 TI Synthesis and properties of some novel high birefringence phenylacetylene liquid crystal materials with lateral substituents  
 AU Sekine, Chizu; Iwakura, Kazunori; Konya, Naoto; Minai, Masayoshi; Fujisawa, Koichi  
 CS Tsukuba Research Laboratory, Sumitomo Chemical Co., Ltd., Tsukuba, 300-3294, Japan  
 SO Liquid Crystals (2001), 28(9), 1375-1387  
 CODEN: LICRE6; ISSN: 0267-8292  
 PB Taylor & Francis Ltd.  
 DT Journal  
 LA English  
 CC 75-11 (Crystallography and Liquid Crystals)  
 Section cross-reference(s): 25, 73  
 AB The authors synthesized and studied new 3-ring phenylacetylene liq. crystals with high birefringence values (.DELTA.n) to improve the nematic temp. range while retaining a high optical anisotropy. In the case of modifying the terminal ring, the introduction of branched alkoxy chains, F or Me groups shifted the nematic phase to lower temps. In order to minimize the influence of the substituent on .DELTA.n, the incorporation of lateral Me groups was chosen as the most profitable method for obtaining wide and low temp. nematic phases. With these results in mind, the authors studied the effect of the position of the Me group on the phys. properties. The most effective Me position for improving the nematic temp. range was on the central ring. From the standpoint of obtaining high .DELTA.n values and low viscosity, the central ring was also the best position.  
 ST mesomorphism birefringence phenylacetylene deriv liq crystal lateral substituent  
 IT Phase transition enthalpy  
 (of phenylacetylene deriv. liq. crystals with lateral substituents)  
 IT Birefringence  
 Polarizability  
 Refractive index  
 Viscosity  
 (of phenylacetylene derivs. with lateral substituents)  
 IT Liquid crystals  
 (synthesis and liq. crystal and optical properties of high-birefringence phenylacetylene derivs. with lateral substituents)  
 IT Liquid crystals  
 (transitions; of phenylacetylene derivs. with lateral substituents)  
 IT 79887-09-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction bromiodobenzene)  
 IT 239104-42-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction phenylacetylene derivs.)  
 IT 374624-58-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction with (pyraniloxy)methylbenzeneacetylene)  
 IT 79887-16-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction with bromiodobenzene)  
 IT 377079-54-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction with diiodobenzene)  
 IT 377079-57-7P 377079-61-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)  
 (prepn. and reaction with ethynylpropylbenzene)  
 IT 119754-16-4P 350035-94-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with hexylphenyl trifloromethanesulfonate)  
 IT 377079-62-4P 377079-64-6P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with hexylphenylethynylbenzeneacetylene)  
 IT 30752-18-2P 99522-34-6P 128740-75-0P 239104-44-0P 377079-51-1P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with methylbutyneol)  
 IT 377079-63-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with methylpropylbenzene  
 trifloromethanesulfonate)  
 IT 62856-45-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with pentyloxy(ethynyl)benzene)  
 IT 119754-13-1P 125151-55-5P 155906-12-0P 377079-52-2P 377079-53-3P  
 377079-58-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with sodium hydroxide)  
 IT 239104-39-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with substituted bromobenzene derivs.)  
 IT 377079-55-5P 377079-59-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with toluenesulfonic acid/methanol/triethylamine)  
 IT 239104-41-7P 377079-56-6P 377079-60-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. and reaction with trifluoromethanesulfonic acid)  
 IT 127769-62-4P 220921-93-7P 239104-40-6P 239104-43-9P 239104-50-8P  
**239104-62-2P 296255-72-6P** 313640-47-0P 377079-36-2P  
 377079-41-9P 377079-44-2P 377079-46-4P  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP  
 (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC  
 (Process)

(prepn., liq. crystal properties, optical properties and viscosity of)

RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Anon; Handbook of Liquid Crystals 1998, V1, P56
- (3) Anon; Handbook of Liquid Crystals 1998, V2B, P835
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